

Amendment and Response

Applicant: David C. Collins

Serial No.: 10/821,130

Filed: April 8, 2004

Docket No.: 200400519-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES

IN THE CLAIMS

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims:

1. (Currently Amended) A method of displaying an image with a display device, the method comprising:
 - receiving image data for the image;
 - generating first and second sub-frames, ~~wherein the first and the second sub-frames comprise a plurality of~~ to include first and second sub-frame pixel values, respectively, and wherein at least a the first one of the plurality of sub-frame pixel values is calculated using the image data and at least a the second one of the plurality of sub-frame pixel values; and
 - alternating between displaying the first sub-frame-frame, including displaying the first sub-frame pixel value, in a first position and displaying the second sub-frame-frame, including displaying the second sub-frame pixel value, in a second position spatially offset from the first position.
2. (Currently Amended) The method of claim 1 further comprising:
 - generating third and fourth sub-frames to include third and fourth, ~~the first, the second, the third, and the fourth sub-frames comprising the plurality of sub-frame pixel values, respectively; and~~
 - alternating between displaying the first sub-frame in the first position and displaying the second sub-frame in the second position spatially offset from the first position, displaying the third sub-frame, -including displaying the third sub-frame pixel value, in a third position spatially offset from the first position and the second position, and displaying the fourth sub-frame, -including the fourth sub-frame pixel value, in a fourth position spatially offset from the first position, the second position, and the third position.
3. (Canceled)

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4. (Currently Amended) The method of claim 3-2 wherein the first ~~one of the plurality of sub-frame pixel values~~ is calculated using the image data, the second ~~one of the plurality of sub-frame pixel values~~, and ~~a the third one of the plurality of sub-frame pixel values that is associated with the fourth sub-frame~~.
5. (Currently Amended) The method of claim 1 wherein a region of influence associated with the first ~~one of the plurality of sub-frame pixel values~~ comprises a number of pixel values that corresponds to a number of iterations used to generate the first and second sub-frames.
6. (Original) The method of claim 1 further comprising:
generating the first and the second sub-frames using a simulation kernel.
7. (Original) The method of claim 1 further comprising:
generating the first and the second sub-frames using an error kernel.
8. (Currently Amended) The method of claim 1 wherein the image comprises a plurality ~~of first and second image pixels, wherein each of the plurality of the first and the second sub-frame pixel values corresponds to a first and second sub-frame pixels, respectively, that is are centered with respect to one of the plurality of the first and the second image pixels, respectively.~~
9. (Currently Amended) The method of claim 1 further comprising:
generating the first and the second sub-frames, ~~wherein the first and the second sub-frames comprise the plurality of sub-frame pixel values, and wherein at least the first one of the plurality of sub-frame pixel values is calculated using the image data, at least the second one of the plurality of sub-frame pixel values, and a plurality of sharpening factors.~~
10. (Original) The method of claim 1 wherein the image data comprises a plurality of pixels at a first resolution, and wherein the first and the second sub-frames comprise a second plurality of pixels at a second resolution less than the first resolution.

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11. (Original) A system for displaying an image, the system comprising:
a buffer adapted to receive image data for the image;
an image processing unit configured to generate first and second sub-frames comprising a plurality of rows of sub-frame pixel values, wherein each of the sub-frame pixel values in each of the plurality of rows is calculated using the image data and at least one sub-frame pixel value from a previous one of the plurality of rows; and
a display device adapted to alternately display the first sub-frame in a first position and the second sub-frame in a second position spatially offset from the first position.
12. (Original) The system of claim 11 wherein the image processing unit is configured to generate the first and the second sub-frames using a simulation kernel.
13. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of $1/4$, $1/4$, and 0, respectively, wherein the three coefficients of the second row have values of $1/4$, $1/4$, and 0, respectively, and wherein the three coefficients of the third row have values of 0, 0, and 0, respectively.
14. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of $1/2$, $1/2$, and 0, respectively, wherein the three coefficients of the second row have values of $1/2$, $1/2$, and 0, respectively, and wherein the three coefficients of the third row have values of 0, 0, and 0, respectively.
15. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of 0, $1/8$, and 0, respectively, wherein the three coefficients of the second row have values of $1/8$, $4/8$, and $1/8$, respectively, and wherein the three coefficients of the third row have values of 0, $1/8$, and 0, respectively.

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16. (Original) The system of claim 12 wherein the simulation kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of $1/16$, $2/16$, $1/16$, respectively, wherein the three coefficients of the second row have values of $2/16$, $4/16$, $2/16$, respectively, and wherein the three coefficients of the third row have values of $1/16$, $2/16$, $1/16$, respectively.

17. (Original) The system of claim 11 wherein the image processing unit is configured to generate the first and the second sub-frames using an error kernel.

18. (Original) The system of claim 17 wherein the error kernel comprises first, second, and third rows which each comprise three coefficients, wherein the three coefficients of the first row have values of 0, 0, and 0, respectively, wherein the three coefficients of the second row have values of 0, $1/4$, and $1/4$, respectively, and wherein the three coefficients of the third row have values of 0, $1/4$, and $1/4$, respectively.

19. (Original) The system of claim 11 wherein the image processing unit is configured to generate third and fourth sub-frames comprising the plurality of rows of sub-frame pixel values, wherein each of the sub-frame pixel values in each of the plurality of rows is calculated using the image data and at least one sub-frame pixel value from a previous one of the plurality of rows.

20. (Original) A system for generating sub-frames for display at spatially offset positions to generate the appearance of an image, the system comprising:

- means for receiving image data corresponding to the image;
- means for generating a plurality of rows of initial values using the image data;
- means for accessing a row of history values generated using the image data; and
- means for generating a sub-frame pixel value using the row of history values and the plurality of rows of initial values.

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21. (Original) The system of claim 20 wherein a number of values in the row of history values and each of the plurality of rows of initial values corresponds to a number of iterations associated with generating the sub-frame pixel value.
22. (Original) The system of claim 20 wherein the row of history values and the plurality of rows of initial values comprise a plurality of columns, wherein a number of the plurality of columns corresponds to a number of iterations associated with generating the sub-frame pixel value.
23. (Original) The system of claim 20 wherein the means for generating the sub-frame pixel value includes means for generating the sub-frame pixel value using the row of history values, the plurality of rows of initial values, a simulation kernel, and an error kernel.
24. (Original) The system of claim 20 wherein the means for generating the sub-frame pixel value includes means for generating the sub-frame pixel value using the row of history values, the plurality of rows of initial values, and a simulation kernel.
25. (Currently Amended) A computer-readable medium storing having computer-executable instructions, which, when executed by a computer processing system, cause the system to for performing a method of generating a sub-frame image which comprises a plurality of sub-frames for display at spatially offset positions to generate the appearance of an image, comprising:
- receiving image data corresponding to the image;
 - generating a first plurality of initial values associated with a first pixel which corresponds to a first one of the plurality of sub-frames using the image data;
 - generating a first sub-frame pixel value using the image data and the first plurality of initial values, wherein the first sub-frame pixel value comprises a first history value;
 - generating a second plurality of initial values associated with a second pixel which corresponds to a second one of the plurality of sub-frames using the image data; and
 - generating a second sub-frame pixel value using the image data, the second plurality of initial values, and the first history value.

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26. (Currently Amended) The computer-readable medium of claim 25 storing having computer-executable instructions-, which, when executed by the computer processing system, cause the system to for perform the method further comprisingfor:

generating a third plurality of initial values associated with a third pixel which corresponds to a third one of the plurality of sub-frames using the image data;

generating a third sub-frame pixel value using the image data and the third plurality of initial values, wherein the third sub-frame pixel value comprises a second history value; and

generating the second sub-frame pixel value using the image data, the second plurality of initial values, the first history value, and the second history value.

27. (Currently Amended) The computer-readable medium of claim 26 storing having computer-executable instructions, which, when executed by the computer processing system, cause the system to for perform the method further comprisingfor:

generating a fourth plurality of initial values associated with a fourth pixel which corresponds to a fourth one of the plurality of sub-frames using the image data; and

generating a fourth sub-frame pixel value using the image data, the fourth plurality of initial values, and the first history value.

28. (Original) The computer-readable medium of claim 27 wherein the first sub-frame pixel value and the third sub-frame pixel value comprise a first row of a sub-frame image, and wherein the second sub-frame pixel value and the fourth sub-frame pixel value comprise a second row of the sub-frame image.

29. (Original) The computer-readable medium of claim 28 wherein the first, the second, the third, and the fourth pixels are centered with respect to a corresponding image pixel in the image.